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Casimir Jones, S.C.
2275 DEMING WAY, SUITE 310
MIDDLETON, WI 53562

EXAMINER	
PEPITONE, MICHAEL F	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Arguments

Applicant's arguments filed 11/15/10 have been fully considered but they are not persuasive. While the amendment after final has been entered, the claims finally rejected in the action mailed 9/14/10 is maintained. The rejection of claims 1-10 and 12-14 based upon Angeletakis *et al.* (US 6,121,344) is maintained for reason of record and the following response {note the rejection of claim 15 based upon Angeletakis *et al.* (US 6,121,344) and claims 16-24 and 26 based upon Angeletakis *et al.* (US 6,121,344) will also be addressed under this heading as Applicants' argued 1-10, 12-24 and 26 collectively}.

Angeletakis *et al.* (US '344) disclose example A (8:15-30) comprising 27.6 wt% of Resin containing bisphenol A diglycidyl ether dimethacrylate, triethyleneglycol dimethacrylate, camphorquinone, and 2-ethyhexyl-4-(dimethylamino)benzoate (6:52-65; Table 2); 63.7 wt% of silanated {{γ-methacryloxypropyltrimethoxysilane} barium aluminoborosilicate having a mean particle size of 0.62 μm {prepared by milling (ground) (5:35-6:36), radiopaque (8:31-45; Table 4)}; 5.0 wt% of silanated {γ-methacryloxypropyltrimethoxysilane} OX-50 fumed silica having an average particle size of 0.04 μm {40 nm}, and 3.7 wt% of TS-530 heaxmethyldisilazane treated fumed silica (7:37-44) having an average particle size of 0.02 μm {20 nm}.

As claimed, claim 1 recites at least 50% by weight of the nanoparticles having a particle diameter of less than 200 nm (ln. 6-7); at least 20 particle number% of the nanoparticles are aggregated particles (ln. 8-9). Applicant's argue that TS-530 fumed silica having an average particle size of 0.02 μm {20 nm} does not read on the claimed invention, as the primary particle size is 20 nm. The examiner notes that claim 1 recites a nanoparticles having a particle diameter of less than 200 nm {see lines 6-7}, and does not specify if the diameter is the primary,

aggregated, or agglomerated diameter. As a result, the treated TS-530 silica having a primary particle size of 20 nm meets the claimed limitation of at least 50% by weight of the nanoparticles having a particle diameter of less than 200 nm, as claim 1 fails to specify which diameter {primary, aggregate, agglomerated} is less than 200 nm; i.e. treated TS-530 has a primary particle size of 20 nm, which is a nanoparticle having a diameter of less than 200 nm.

Applicants argue that OX-50 fumed silica having an average particle size of 0.04 μm {40 nm} does not read on the claimed invention, as the primary particle size is 40 nm. The examiner notes that claim 1 recites a nanoparticles having a particle diameter of less than 200 nm {see lines 6-7}, and does not specify if the diameter is the primary, aggregated, or agglomerated diameter. As a result, the silanated OX-50 silica having a primary particle size of 40 nm meets the claimed limitation of at least 50% by weight of the nanoparticles having a particle diameter of less than 200 nm, as claim 1 fails to specify which diameter {primary, aggregate, agglomerated} is less than 200 nm; i.e. treated TS-530 OX-50 has a primary particle size of 40 nm, which is a nanoparticle having a diameter of less than 200 nm.

The examiner notes claim 1 is a product claim. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) [See MPEP 2113].

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., incorporation

of nanofiller in 90 minutes at 1200 rpm with the aid of Dispermat; the mixture dispersed for 1 h at 1000 rpm and subsequently overnight at 500 rpm) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant's argue that the particles disclosed in Angeletakis *et al.* (US '344) [5.0 wt% of silanated {γ-methacryloxypropyltrimethoxysilane} OX-50 fumed silica having an average particle size of 0.04 μm {40 nm}, and 3.7 wt% of TS-530 heaxmethyldisilazane treated fumed silica (7:37-44) having an average particle size of 0.02 μm {20 nm}] when measured via laser diffractometry {see remarks, pg. 3-4} would afford particle sizes of the aggregate {200-300 nm} and not of the primary particle. However, applicant has failed to provide data {evidence} that silanated {γ-methacryloxypropyltrimethoxysilane} OX-50 fumed silica and TS-530 heaxmethyldisilazane treated fumed silica (7:37-44) when measured via laser diffractometry would afford particle sizes of the aggregate {200-300 nm}, as opposed to the particle sizes of 40 nm and 20 nm, respectively, as disclosed by Angeletakis *et al.* (US '344). The arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965) [See MPEP 716.01(c)]; arguments of counsel cannot take the place of factually supported objective evidence. See, e.g., *In re Huang*, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) [See MPEP 2145].

The rejection of claim 11 based upon Angeletakis *et al.* (US 6,121,344) and Teramae *et al.* (US 2002/0022677) or Sato (US 5,773,489) is maintained for reason of record and the

following response. Applicants' arguments regarding Angeletakis *et al.* (US 6,121,344) have been sufficiently addressed above. Teramae *et al.* (US '677) was relied on for disclosing dental composite materials (¶ 1) comprising organo-inorganic fillers (¶ 36) prepared by polymerization-covering the surface of an inorganic filler or aggregate filler (¶ 24, 31-33) with a polymerizable monomer, and then grinding it to a proper particle size of 0.5 to 30 μm (¶ 24, 31, 36).

Sato (US '489) was relied on for disclosing dental composite materials (1:5-15) comprising inorganic-organic composite fillers having a particle size of 0.1 to 50 μm (7:33-49; 8:65-9:25) which provide dental restorative materials having superior mechanical strength and abrasion resistance and a suitable consistency and handling, shows a coefficient of thermal expansion close to teeth and a low shrinkage value, and exhibits a suitable transparency and surface smoothness (3:35-43; 29:1-11).

The rejection of claim 25 based upon Angeletakis *et al.* (US 6,121,344) and Teramae *et al.* (US 2002/0022677) or Sato (US 5,773,489) is maintained for reason of record and the following response. Applicants' arguments regarding Angeletakis *et al.* (US 6,121,344) have been sufficiently addressed above. Teramae *et al.* (US '677) was relied on for disclosing dental composite materials (¶ 1) comprising organo-inorganic fillers (¶ 36) prepared by polymerization-covering the surface of an inorganic filler or aggregate filler (¶ 24, 31-33) with a polymerizable monomer, and then grinding it to a proper particle size of 0.5 to 30 μm (¶ 24, 31, 36).

Sato (US '489) was relied on for disclosing dental composite materials (1:5-15) comprising inorganic-organic composite fillers having a particle size of 0.1 to 50 μm (7:33-49; 8:65-9:25) which provide dental restorative materials having superior mechanical strength and abrasion resistance and a suitable consistency and handling, shows a coefficient of thermal

expansion close to teeth and a low shrinkage value, and exhibits a suitable transparency and surface smoothness (3:35-43; 29:1-11).

For convenience, the relevant text of the claims finally rejected on 11/15/10 is listed below.

Claims 1-10 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Angeletakis *et al.* (US 6,121,344).

Regarding claims 1-10, 12-14: Angeletakis *et al.* teaches dental composite resin (1:10-18), with example A (8:15-30) comprising 27.6 wt% of Resin containing bisphenol A diglycidyl ether dimethacrylate, triethyleneglycol dimethacrylate, camphorquinone, and 2-ethyhexyl-4-(dimethylamino)benzoate (6:52-65; Table 2); 63.7 wt% of silanated {{γ-methacryloxypropyltrimethoxysilane} barium aluminoborosilicate having a mean particle size of 0.62 μm {prepared by milling (ground) (5:35-6:36), radiopaque (8:31-45; Table 4)}; 5.0 wt% of silanated {γ-methacryloxypropyltrimethoxysilane} OX-50 fumed silica having an average particle size of 0.04 μm {40 nm}, and 3.7 wt% of TS-530 heaxmethyldisilazane treated fumed silica (7:37-44) having an average particle size of 0.02 μm {20 nm}.

Note: the instant specification discloses feature b) of the claim is obtained after the nanoscale filler is incorporated into the binder {see specification, pg. 3, ln. 20-24; pg. 5, ln. 17-27; pg. 24, ln. 12-19}. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) [See MPEP 2113].

The Office realizes that all the claimed effects or physical properties are not positively stated by the reference. However, the reference teaches all of the claimed reagents and was prepared under similar conditions. Therefore, the claimed effects and physical properties, i.e. the nanoscale filler having at least 20 particle number% of nanoparticles as aggregated particles, would inherently be achieved by a composition with all the claimed ingredients. If it is the applicants' position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties and effects with only the claimed ingredients.

Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Angeletakis *et al.* (US 6,121,344).

Regarding claim 15: Angeletakis *et al.* teaches a process for preparing dental composite resin for use in dental restoratives (1:10-27; example A; 8:15-30), the composite resin was prepared by mixing: 27.6 wt% of Resin containing bisphenol A diglycidyl ether dimethacrylate,

triethyleneglycol dimethacrylate, camphorquinone, and 2-ethyhexyl-4-(dimethylamino)benzoate (6:52-65; Table 2); 63.7 wt% of silanated {{γ-methacryloxypropyltrimethoxysilane} barium aluminoborosilicate having a mean particle size of 0.62 μm {prepared by milling (ground) (5:35-6:36)}; 5.0 wt% of silanated OX-50 fumed silica having an average particle size of 0.04 μm {40 nm}, prepared by silanating agglomerated OX-50 fumed silica with γ-methacryloxypropyltrimethoxysilane (7:25-35); and 3.7 wt% of TS-530 heaxmethyldisilazane treated fumed silica (7:37-44) having an average particle size of 0.02 μm {20 nm} (example A; 8:15-30) [the resin was prepared; OX-50 fumed silica (40 nm) was treated with γ-methacryloxypropyltrimethoxysilane; barium aluminoborosilicate (0.62 μm) was prepared by milling (ground); the silanated fillers and Resin were thoroughly mixed]; and the samples were cured into a dental composite (8:62-66) for stress/load bearing restorations (9:12-10;21; 11:14-24) such as crowns, inlays, onlays, fillings, etc (1:10-27).

The Office realizes that all the claimed effects or physical properties are not positively stated by the reference. However, the reference teaches all of the claimed reagents and was prepared under similar conditions. Therefore, the claimed effects and physical properties, i.e. incorporation of the nanoscale filler into the organic binder until at least 50 wt% of nanoscale filler has a particle diameter of less than 200 nm, would inherently be achieved by a composition with all the claimed ingredients. If it is the applicants' position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties and effects with only the claimed ingredients.

Claims 16-24 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Angeletakis *et al.* (US 6,121,344).

Regarding claims 16-24 and 26: Angeletakis *et al.* teaches process for the production of a dental composite resin (1:10-27; example A; 8:15-30), the composite resin was prepared by mixing: 27.6 wt% of Resin containing bisphenol A diglycidyl ether dimethacrylate, triethyleneglycol dimethacrylate, camphorquinone, and 2-ethyhexyl-4-(dimethylamino)benzoate (6:52-65; Table 2); 63.7 wt% of silanated {{γ-methacryloxypropyltrimethoxysilane} barium aluminoborosilicate having a mean particle size of 0.62 μm {prepared by milling (ground) (5:35-6:36)}; 5.0 wt% of silanated OX-50 fumed silica having an average particle size of 0.04 μm {40 nm}, prepared by silanating agglomerated OX-50 fumed silica with γ-methacryloxypropyltrimethoxysilane {polymerizable; i.e. a binder} by spraying in a V-blender (7:25-35); and 3.7 wt% of TS-530 heaxmethyldisilazane treated fumed silica (7:37-44) having an average particle size of 0.02 μm {20 nm} (example A; 8:15-30) [the resin was prepared; OX-50 fumed silica (40 nm) was treated with γ-methacryloxypropyltrimethoxysilane by spraying in a V-blender; barium aluminoborosilicate (0.62 μm) was prepared by milling (ground); the silanated fillers and Resin were thoroughly mixed]; and the samples were cured into a dental composite (8:62-66) for stress/load bearing restorations (9:12-10;21; 11:14-24) such as crowns, inlays, onlays, fillings, etc (1:10-27).

The Office realizes that all the claimed effects or physical properties are not positively stated by the reference. However, the reference teaches all of the claimed reagents and was prepared under similar conditions. Therefore, the claimed effects and physical properties, i.e. incorporation of the nanoscale filler into the organic binder until at least 50 wt% of nanoscale

filler has a particle diameter of less than 200 nm, would inherently be achieved by a composition with all the claimed ingredients. If it is the applicants' position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties and effects with only the claimed ingredients.

Claim Rejections - 35 USC § 103

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Angeletakis *et al.* (US 6,121,344) as applied to claim 1 above, and further in view of Teramae *et al.* (US 2002/0022677); or further in view of Sato (US 5,773,489).

Regarding claim 11: Angeletakis *et al.* teaches the basic claimed composition [as set forth above with respect to claim 1].

Angeletakis *et al.* does not teach the filler of instant claim 11. However, Teramae *et al.* teaches dental composite materials (¶ 1) comprising organo-inorganic fillers (¶ 36) prepared by polymerization-covering the surface of an inorganic filler or aggregate filler (¶ 24, 31-33) with a polymerizable monomer, and then grinding it to a proper particle size of 0.5 to 30 μm (¶ 24, 31, 36). Angeletakis *et al.* and Teramae *et al.* are analogous art because they are concerned with a similar technical difficulty, namely the preparation dental composite resins. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined 0.5 to 30 μm organo-inorganic fillers, as taught by Teramae *et al.* in the invention of Angeletakis *et al.*, and would have been motivated to do so since Teramae *et al.* suggests that such organo-inorganic fillers are known fillers generally used in dental composites (¶ 36).

Alternatively, Angeletakis *et al.* does not teach the filler of instant claim 11. However, Sato teaches dental composite materials (1:5-15) comprising inorganic-organic composite fillers having a particle size of 0.1 to 50 μm (7:33-49; 8:65-9:25). Angeletakis *et al.* and Sato are analogous art because they are concerned with a similar technical difficulty, namely the preparation dental composite resins. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined 0.1 to 50 μm inorganic-organic composite fillers, as taught by Sato in the invention of Angeletakis *et al.*, and would have been motivated to do so since Sato suggests that such inorganic-organic composite fillers provide dental restorative materials having superior mechanical strength and abrasion resistance and a suitable consistency and handling, shows a coefficient of thermal expansion close to teeth and a low shrinkage value, and exhibits a suitable transparency and surface smoothness (3:35-43; 29:1-11).

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Angeletakis *et al.* (US 6,121,344) as applied to claim 16 above, and further in view of Teramae *et al.* (US 2002/0022677); or further in view of Sato (US 5,773,489).

Regarding claim 25: Angeletakis *et al.* teaches the basic claimed composition [as set forth above with respect to claim 16].

Angeletakis *et al.* does not teach the filler of instant claim 11. However, Teramae *et al.* teaches dental composite materials (¶ 1) comprising organo-inorganic fillers (¶ 36) prepared by polymerization-covering the surface of an inorganic filler or aggregate filler (¶ 24, 31-33) with a polymerizable monomer, and then grinding it to a proper particle size of 0.5 to 30 μm (¶ 24, 31, 36). Angeletakis *et al.* and Teramae *et al.* are analogous art because they are concerned with a

similar technical difficulty, namely the preparation dental composite resins. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined 0.5 to 30 μm organo-inorganic fillers, as taught by Teramae *et al.* in the invention of Angeletakis *et al.*, and would have been motivated to do so since Teramae *et al.* suggests that such organo-inorganic fillers are known fillers generally used in dental composites (¶ 36).

Alternatively, Angeletakis *et al.* does not teach the filler of instant claim 11. However, Sato teaches dental composite materials (1:5-15) comprising inorganic-organic composite fillers having a particle size of 0.1 to 50 μm (7:33-49; 8:65-9:25). Angeletakis *et al.* and Sato are analogous art because they are concerned with a similar technical difficulty, namely the preparation dental composite resins. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined 0.1 to 50 μm inorganic-organic composite fillers, as taught by Sato in the invention of Angeletakis *et al.*, and would have been motivated to do so since Sato suggests that such inorganic-organic composite fillers provide dental restorative materials having superior mechanical strength and abrasion resistance and a suitable consistency and handling, shows a coefficient of thermal expansion close to teeth and a low shrinkage value, and exhibits a suitable transparency and surface smoothness (3:35-43; 29:1-11).

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL PEPITONE whose telephone number is (571)270-3299. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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MFP
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/Mark Eashoo/
Supervisory Patent Examiner, Art Unit 1767